

THE NEW ENGLAND CENTENARIAN STUDY

JANUARY 2024 ISSUE



Greetings! We hope this newsletter finds you and your loved ones well at the start of this new year. If you are currently enrolled and have been waiting to hear from us, PLEASE contact us! Participants can call or email the main lines, get in touch with their regular staff contact, or call or email Dr. Perls. Our staying in touch with you is very important, and since phone numbers and addresses change or other obstacles occur, we can have difficulty contacting some of our very precious participants. Please see our contact information to the right.

We are also still actively recruiting participants! If you or anyone you know in North America is 100 or older and could be interested in our study, please pass them on to us.

Toll-Free Number

1-888-333-6327

Email

agewell@bu.edu

Address

72 E Concord St, L912
Boston, MA, 02118



Thomas Perls



Stacy Andersen

UPCOMING EVENT

YOU'RE INVITED! We are hosting our annual LIVE Zoom webinar for our study participants, families, and friends. Please sign on at the link below to join Tom Perls, MD and Stacy Andersen, PhD as they discuss study findings and answer your questions.

FEBRUARY 29, 2024

3:30-5:00 PM EST

<http://tinyurl.com/100study2024>

Meeting ID: 928 3278 8152
Passcode: 100study

Dial-in Number: 1(309)205-3325

Principal Investigators

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OUR STUDIES

NECS

www.bumc.bu.edu/centenarian/

Founded in 1995, the New England Centenarian Study (NECS) is our over-arching study and masthead, directed by Dr. Tom Perls and Dr. Stacy Andersen. Our collection of studies is, to date, the largest study of centenarians and their family members in the world, accumulating over 3,000 participants. All of the below studies are funded by the National Institute on Aging, an Institute of the National Institutes of Health (NIH).

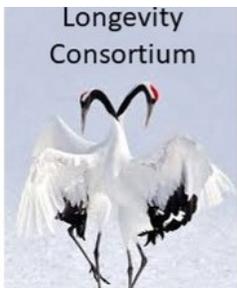


The New England Centenarian Study

LC

www.longevityconsortium.org/home/

The Longevity Consortium (LC) is a group of coordinated research projects at 7 universities studying the biological bases of longevity in many different animal species and humans. We, of course, lead the LC Centenarian Project. With a small sample of blood and a stool sample kindly provided by our participants, we produce data about hundreds of thousands of proteins, metabolites, genes and other biologically active determinants of how we age and how some people live to 100 and beyond.



ILO

www.longevityomics.org

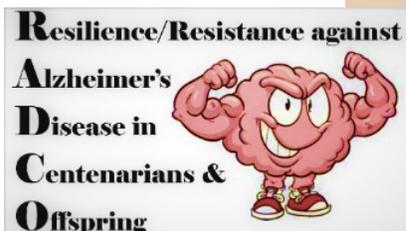
The Integrative Longevity Omics Study (ILO) is similar to LC; it includes partner sites at Georgia State University and Albert Einstein School of Medicine (NYC). Both ILO and the LC Centenarian Project specialize in collecting detailed cognitive function data because we are so interested in how centenarians markedly delay or even escape Alzheimer's disease and other dementias.



RADCO

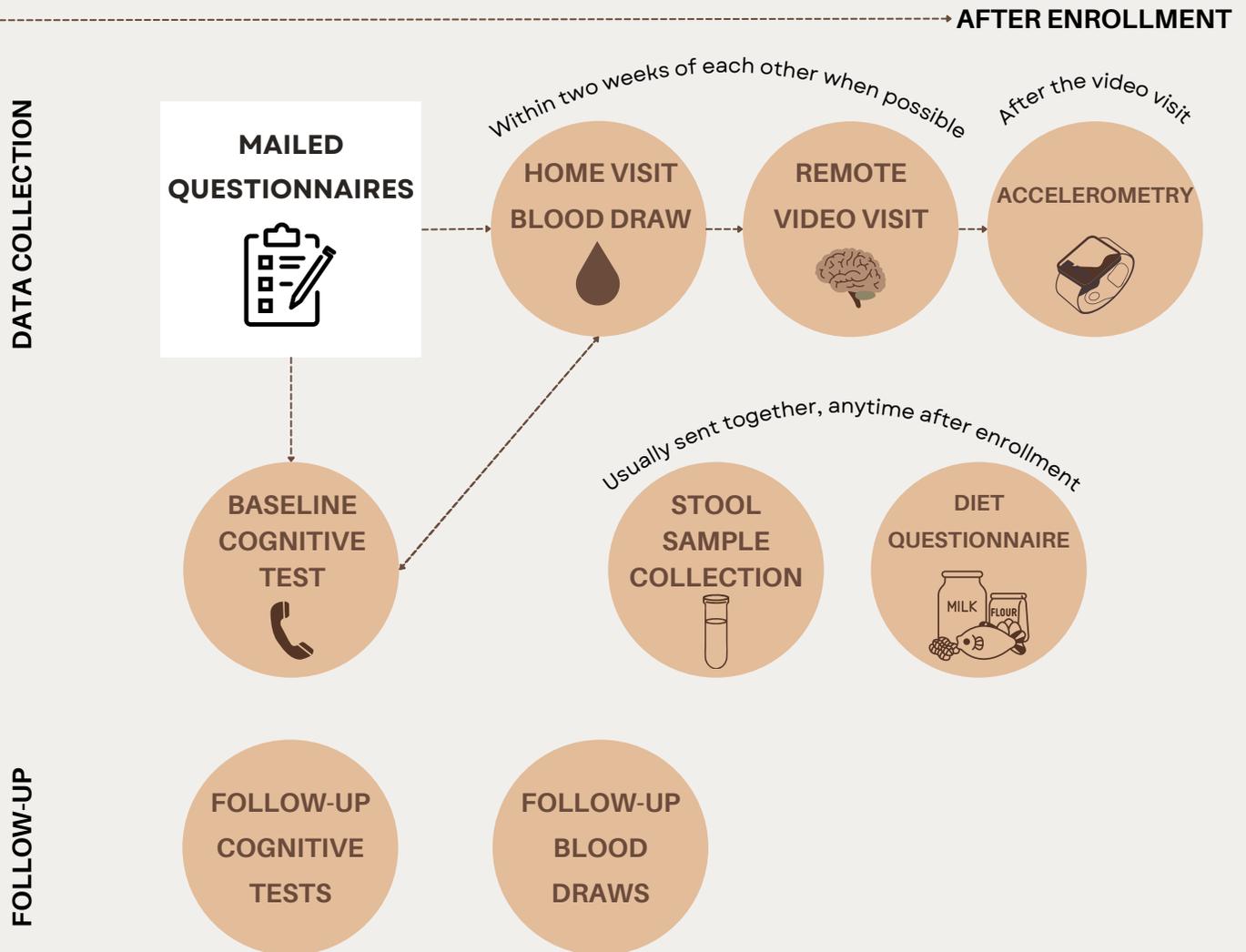
www.bumc.bu.edu/centenarian/radco/

Our newest study, the Resilience/Resistance against Alzheimer's Disease in Centenarians & Offspring project, aims to examine why some centenarians and offspring have youthful brain function, similar to someone 30 years younger. We call these exceptional people "cognitive superagers". We then study their blood biomarkers, brain images, and brain tissue after death to learn what factors enable some people to stay so spectacularly cognitively healthy for so long.



STUDY FLOWCHART

HERE'S AN OVERVIEW OF HOW THINGS GENERALLY MOVE ALONG FOR PARTICIPANTS IN OUR STUDIES!



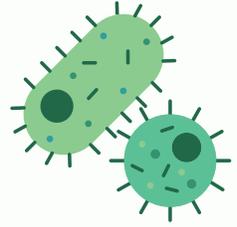
We would like to remind our participants that participation in the study is voluntary! Most of our participants enroll with us for their whole lives. We greatly appreciate all that our participants do for us but if there are any study components that you do not wish to do, just let us know.

This study is extremely valuable. [It] promotes self-awareness, feelings of great meaning and self-worth, positivity, social engagement, [and] greater self-determination. Participating only increases my bond with my mother and my own belief in longevity research.

Current ILO Participant



FAQ



CAN I SEE ANY OF MY RESULTS?

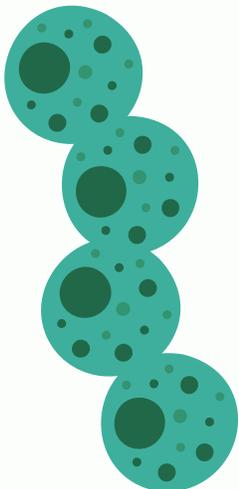
We are currently able to provide complete blood counts and physical activity data from the blood draw and accelerometry portions of the study, respectively. We are working to find ways to deliver more results that may be of interest to you.

We really want to give back as much as we can to our participants given how much they give to us. Unfortunately, our results are harder to share than they seem. The genetic results that we obtain from our participants' blood and stool samples are meaningless to provide until we and other scientists understand the clinical utility of these findings. Many participants have also expressed interest in receiving results from the cognitive tests that are performed in this study. These tests are performed for research purposes and therefore we cannot offer clinical interpretations. Clinical assessments require lengthier and more in-depth evaluations that are tailored to your specific strengths and weaknesses and assess many other health factors that can contribute to your test performance, such as lack of sleep, stress, illness, medications and certain medical conditions, and even daily variations in brain function. If you have any concerns about your memory or thinking ability, we strongly encourage you to speak with your physician, who knows your full clinical picture and can provide a referral for a clinical assessment if needed.

WHAT ARE YOU LOOKING FOR IN MY BLOOD?

Basically, we are attempting to understand what genes in centenarians and their children are protecting them from the processes of aging that increase the risk for aging related diseases like Alzheimer's, cancer, stroke and so on. We are also generating data from the blood sample that includes thousands of proteins and metabolites that further help us understand these protective mechanisms.

Understanding how these mechanisms work can lead to developing drugs that might help other people age more slowly and avoid or at least delay some or all of these diseases.



WHY ARE YOU ENROLLING SPOUSES?

Even though spouses of centenarian offspring may lack a family history of longevity, we are keenly hopeful of enrolling them to better understand how the environment and behaviors that they share with their spouse play roles in longevity and healthy aging.

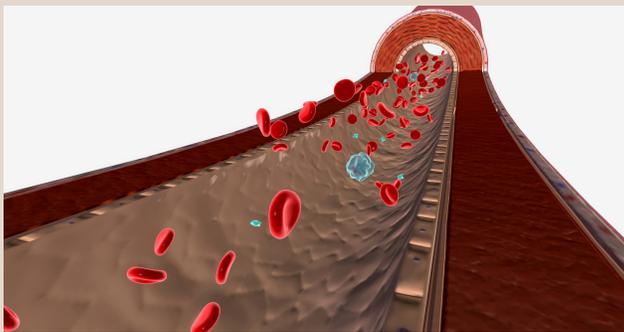
WHAT ARE YOUR RECENT FINDINGS?



ORAL HEALTH

doi.org/10.1161/STROKEAHA.123.042528
doi.org/10.1111%2Fjgs.12842

The New England Centenarian study (NECS), quite some time ago, published a paper about the oral health history of our centenarians and their children, who are in their 70s and 80s (Kaufman L et al. *Journal American Geriatrics Society*, 2014). At the time there was a lot of press about how chronic inflammation of the gums, called gingivitis, is associated with increased risk for heart disease. The likely reason is that the inflammatory substances in the gums leak into the blood stream and these can worsen the buildup of atherosclerotic plaque (a process called peroxidation) in the blood vessels that feed the heart.



One of our clues that many centenarians and their children had a history of less gum disease was that many still have their teeth. For people who aged when before fluoridation of drinking water (begun around 1945 and became widespread around 1960), tooth loss and the need for dentures was common. “I remember advertisements for polydent denture adhesive and cleaner as a kid in the 1960s and 1970’s; you don’t see those ads anymore”, remarks Dr. Perls, the director of the NECS. Despite tooth loss being so common, our paper showed that centenarians and their kids bucked the trend.

Several possible reasons include: (1) smoking cigarettes causes gum disease and tooth loss and smoking is uncommon, especially at later age, in our study participants, (2) our participants possibly take better care of their teeth and gums,

but we don’t know that, and (3) perhaps centenarians have some genes or other biology that makes their gums less prone to inflammation.



Illustration from: S. Sen et al. Dental Caries, Race and Incident Ischemic Stroke, Coronary Heart Disease and Death. Stroke Nov 2023

Now, in a November 2023 article from the American Heart Association’s journal, *Stroke*, researchers note that dental cavities and tooth loss are associated with increased risk for heart attack, stroke and as a result, even death. The association was even greater among African Americans compared to Whites. Regular dental care was associated with decreased risk. “I suspect part of this finding has to do with the fact that people who get regular dental care, also have better access to health care and medications generally and they might also have better health-related habits”, says Dr. Perls. But still, the centenarian study findings and these recent findings both support that flossing your teeth every day and seeing your dentist regularly likely has an important overall health benefit.



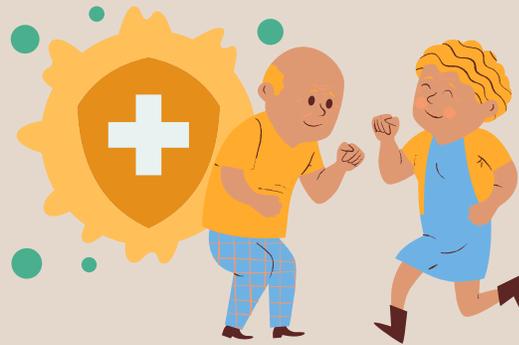
COVID-19 hit people ages 85+ the hardest, but centenarians not so much. “I never had a cold in my life!” That’s a refrain that might sound very familiar if you are a centenarian or a family member of one. That has certainly been our experience with many of our centenarian study participants. In Germany, the government determined that a horrendous 47% of people age 80-89 years who contracted COVID-19, died from it. However, they noted that infected centenarians died at half that rate (23%). A French study found that centenarians had proportionately fewer COVID-19 related hospital admissions than octogenarians (ages 80-89) and nonagenarians (ages 90-95).



The New England Centenarian Study noted that the vast majority of centenarians compress the time they experience disability towards the end of their lives. In a sample of centenarians who lived to an average age of 101 years, about 90% were independent in their activities of daily living at age 93 years. For centenarians who live to even older ages, for example 109 years old, those individuals were generally independent in their activities of daily living (ADLs) at the average age of 105 years. So, centenarians generally do very well for over 90% of their very long lives and it’s only in the last few years of their lives that they experience a significant increase in frailty and vulnerability to diseases. Thus, those centenarians who succumbed to COVID-19 were likely those in the terminal decline phase of their lives, during a phase called immunosenescence.



Immunosenescence is basically an immune system gone awry, with the overproduction of inflammatory substances that cause a wide range of problems including worsening clogging of the blood vessels, increased risk for cancer, frailty and counter-intuitively, a decreased ability to fight infections, like COVID-19, pneumonia and urinary tract infections. Again, for the vast majority of their lives, centenarians appear to be able to delay this immunosenescence which is likely why many of them fare better than the average 85 year old.



In a recently published study led by Tufts Medical Center graduate student Tanya Karagiannis, she and co-authors affiliated with the New England Centenarian Study found that centenarians have highly functional immune systems until their period of terminal decline at the end of their lives. Such an intact immune system may play a role in lower than expected rates in centenarians of cancer, cardiovascular disease, stroke, and dementia. The study was funded by the National Institute on Aging.

HOW CAN I KEEP UP WITH YOUR PUBLICATIONS?

Media articles about the study are regularly posted at:

- www.longevityomics.org/news/
- www.bumc.bu.edu/centenarian/publications/

RESEARCH COLLABORATOR SPOTLIGHT

Dr. Daniel Segrè is professor of biology, bioinformatics, and biomedical engineering at Boston University. His research focuses on the gut microbiome, or the bacteria that live in our gut. Dr. Segrè received his PhD (2002) at the Weizmann Institute of Science in Israel and his BA and MS (1994) from the University of Trieste in Italy.



Dr. Segrè is a world-renowned scientist in the field of studying the bacteria and viruses that normally live and thrive in our gut. As Dr. Segrè and other scientists have discovered, the human intestine is home to billions of bacteria. Over a thousand different species exist in the gut, and these bacteria are not just passive bystanders.

Bacteria use nutrients in the gut to produce metabolites and other substances that help us digest fats, fiber and other molecules. Some metabolites that they produce enter the bloodstream and are used by our cells in a way that boosts the immune system and decreases our risk for clogged blood vessels. An association has even been made with certain species of bacteria and decreased risk for Alzheimer's disease. Substances produced by bacteria make their way via the bloodstream to the brain where they directly enhance brain health. This connection between certain species of bacteria and the brain is called the "gut-brain axis".

What is also really interesting is that our genes can affect which bacteria species are most common in our gut.

Some genes lead to the production of particular proteins that occur in the inner lining of our intestines and these in turn help certain types of bacteria thrive. We also know that genes play an important role in longevity and the ability to live to 100 years and older. So, it follows that some species of bacteria in the gut may be important for the ability to become a centenarian or to healthy brain aging.

As you might imagine, with there being thousands of possible different species of bacteria in the gut and many different substances produced by those bacteria in varying amounts, coming up with answers about which bacteria are associated with healthy aging and how they slow aging and decrease risk for diseases like Alzheimer's and heart disease is an extremely complicated puzzle to solve. Sorting out that complexity and understanding the major factors at play is Dr. Segrè's specialty. He is a leader in the field of using computer programming (called machine learning and networks) to make these discoveries.

This is why our collection of your stool sample is so important to our research. Once we receive your sample, it is sent to a laboratory to determine the amounts of different species of bacteria and substances produced by the bacteria. All of that data then goes to Dr. Segrè's laboratory at Boston University. So thank you to those who have already provided us with stool samples, and we encourage others to please support this very important part of our research by providing us with theirs!

MEET

Our Researchers

We have an incredible team of Principal Investigators, Project Managers, Research Specialists, and student researchers who all contribute deeply to our studies!



Thomas Perls

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Tom Perls, MD, MPH is founder and director of the New England Centenarian Study (NECS), the largest study of centenarians and their families in the world. He is among the international leaders in the field of human exceptional longevity. Dr. Perls is the Robert Dawson Evans Distinguished Professor of Medicine at Boston University Chobanian and Avedisian School of Medicine and he practices medicine as an attending physician in Geriatrics at Boston Medical Center.

One of the things that Dr. Perls enjoys most about his work is the opportunity to answer the phones and have chats with our incredible study participants. “I’m one of the luckiest guys on the planet”, Dr. Perls says. “I answer the phone and there’s a centenarian on the line for me to talk with. It’s always amazing!”

PRINCIPAL INVESTIGATORS



Stacy Andersen

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Stacy Andersen, PhD is the co-director of the New England Centenarian Study. She is a behavioral neuroscientist and is one of the world’s experts in how the brain functions at ages beyond a hundred years. Dr. Andersen says, “by studying the cognitive function of our centenarians, we are learning about how many of these individuals remain cognitively well at extreme old age.” One area of her research focuses on identifying the earliest clinical clues of memory and thinking difficulties which may allow for earlier therapeutic interventions. Dr. Andersen remarks, “I can’t tell you what an incredible privilege it is to work with such amazing and special people, the study’s centenarians and their children!”



Paola Sebastiani

psebastiani@tuftsmedicalcenter.org

Paola Sebastiani, PhD leads the data analyses and experimental design efforts for the New England Centenarian Study and its NIH-funded projects. She is Professor of Biostatistics at Tufts University and Tufts Medical Center where she Directs the Biostatistics, Epidemiology, and Research Design (BERD) Center. Professor Sebastiani is the foremost authority in combining different types of data from clinical characteristics to genes, proteins and metabolites in the blood in order to understand the biology of how centenarians and their family members age so slowly and delay or escape aging related diseases.

Visiting Professor



Nadine Ouellette

nouvellet@bu.edu

Nadine Ouellette, PhD is an Associate Professor of Demography at the University of Montreal. Dr. Ouellette is one of the leading experts in the world in the study of how mortality rates change at very old ages and can be different at these very old ages for different populations. We are so very fortunate to have Dr. Ouellette joining as a visiting scholar for the 2023-2024 academic year!

PROJECT MANAGERS

Senior Project Manager



Reena Karki

617-353-2218

| reenakar@bu.edu

Reena is a registered nurse from Nepal and earned her MPH from Brigham Young University, Utah in Global Health. Reena has been with NECS for over 4 years and is interested in learning more about age-related neurodegenerative diseases, biomarkers of aging, and how stress, sleep, and nutrition impact aging.



Brad Petrowitz

617-353-2443

| bpetro@bu.edu

Brad earned his BS in Human Biology from Michigan State University, followed by an MPH in Epidemiology from the University of Michigan. Brad has been with NECS for over 4 years, and his interests are in Alzheimer's disease, with a focus on identifying ways to prevent the disease rather than needing to treat it.



Brian Gould

617-353-2590

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Brian graduated from Connecticut College with a bachelor's degree in Neuroscience and minored in Computer Science. Brian is interested in the development of new medical technologies and biotechnology therapies relating to preventive medicine.



Cristian Ibarra

617-353-0919

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Cris holds a bachelor's degree in psychology and a master's degree in psychology with a focus on neuropsychology. He has a strong interest in promoting healthy aging and actively engages in research that extends to underrepresented communities. Cris is dedicated to equitable brain health initiatives, bilingualism, and representation of the Hispanic-Latinx community in research.

RESEARCH SPECIALISTS



Senior Research Specialist

Parsh Mody 617-353-6380 | pnmody@bu.edu

Parsh graduated from Boston University with a BA in neurobiology. Parsh is interested in neurodegenerative diseases such as Alzheimer’s, neural models of memory, and drug development. He plans to pursue a career in translational research or computational neuroscience.



Evan Carey 617-353-1757 | ejcarey@bu.edu

Evan graduated from Providence College with a BA in Psychology, Neuroscience, and Philosophy. He is interested in abstract and theoretical concepts within psychology, and intends to pursue the more practical route of being a practicing Clinical Psychologist, where he might finally ground himself in reality. Imagine that.



Savannah White 617-353-6441 | svkwhite@bu.edu

Savannah graduated from Boston University with a BS in Human Physiology and is now completing her MPH at the University of New England. Savannah is applying to medical school in the upcoming cycle and hopes to have a career in either family medicine or psychiatry.

designed the newsletter!



Angella Lee 617-358-8127 | angellaa@bu.edu

Angella graduated from Cornell University with a BSc in Human Biology, Health and Society. She is particularly interested in the social determinants of health and how to promote better mental health among older adults. She is not quite sure what she wants to do for her career yet, but she is dedicated to supporting initiatives for advancing equity in health.



Sam Keen 617-358-0081 | samkeen@bu.edu

Sam graduated from Temple University with a BA in Psychology and Neuroscience. He is interested in addiction medicine and quantifying cognitive ability. He will be pursuing a career in Neuropsychology.



Sarah Ibrahim 617-353-0572 | sdi@bu.edu

Sarah graduated from the University of Connecticut with a BS in Health Sciences, with the goal of attending medical school. She is interested in preventative medicine and the impact of lifestyle and nutrition on longevity and healthy aging. In the future, she hopes to work in family medicine to advocate for healthy lifestyles and disease prevention.



Jennifer Lee

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| jelee1@bu.edu

Jennifer graduated from Washington University in St. Louis with a bachelors in Psychology. By furthering her research experience, she hopes to continue her education by attending medical school in the future and working to specialize in geriatrics.



Jaweria Shah

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| shahj@bu.edu

Jaweria graduated from Smith College with a degree in Spanish and a Five College Culture, Health, and Science Certificate. She hopes to pursue a career in medicine with a focus in community health and health equity for underrepresented populations.

PART-TIME RESEARCH ASSISTANTS



Aaron Fleishman

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Aaron will graduate Connecticut College this spring with a bachelor's degree in Psychology. He is interested in epidemiology and statistics and plans to have a career in research involving health equity.

designed the
newsletter!



Carly Ng

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Carly holds a bachelor's degree in Psychology from Ithaca College and is currently pursuing a master's degree in Mental Health Counseling and Behavioral Medicine at Boston University. She hopes to dedicate her career to providing behavioral health support to older adults.



Andrea Paipilla

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Andrea is a graduate student in the Mental Health Counseling & Behavioral Medicine program at Boston University. Fluent in both English and Spanish, she is enthusiastic about leveraging her bilingual skills to make a positive impact in the field.

STUDENT RESEARCHERS



Seho Park

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Seho is a graduate research fellow who is interested in underlying mechanisms of neurological changes and resistance/resilience to neurological diseases. He is working toward utilizing informatics approaches to understand cognitive changes relating to aging.



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... and many more! We have had countless student researchers support us throughout the years, and we are very grateful to all of them for their help with the study.

We would also not be able to do this research without the support of our wonderful participants and their family members. Thank you so, so, so much again! If there is any reason that you'd like to get in touch with us, our mainline phone number and email are below.

agewell@bu.edu

1-888-333-6327